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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/877,923	06/08/2001	Eckard Deichsel	21137.PUS	2515

7590 05/22/2002

EUGENE E. RENZ, JR., P.C.
P.O. Box 2056
205 North Monroe Street
Media, PA 19063-9056

EXAMINER	
INZIRILLO, GIOACCHINO	
ART UNIT	PAPER NUMBER
2828	

DATE MAILED: 05/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/877,923	DEICHSEL ET AL.	
	Examiner	Art Unit	
	Gioacchino Inzirillo	2828	

-- The MAILING DATE of this communication appears on the cover sheet with the corresp ndence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Paul Ip
PAUL IP
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

Claims 6 – 9, 12, 13 and 21 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in the alternative only and cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims 6 – 9, 12, 13 and 21 have not been further treated on the merits.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5 and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd.

App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 5 recites the broad recitation "small than 0.005nm", and the claim also recites "especially smaller than 0.001" which is the narrower statement of the range/limitation. Furthermore, the lower limit of the range is not explicitly set forth, which leads to further indefiniteness. The lower limit cannot be zero, for zero would mean that there is no mismatch. Therefore, it logically follows that if there is mismatch necessitated by the claim language, the lower limit must not be zero but a non-zero positive number. Without knowledge of this number, the scope of the claims cannot be fully determined.

Claims 11 and 19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "low-temperature layer" renders the claim indefinite. Is it manufactured under low temperature, is it in contact with a TEC, or is it only operating in a certain temperature range? Correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 10 and 11 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Knox US 5,627,854 (herein after known as Knox).

Regarding claims 1, 10 and 11, Fig. 1 shows the first embodiment of Knox's saturable Bragg reflector (SBR). Reference numeral 14 denotes a substrate, the Bragg reflector portion is made up of alternating layers 12 and 13, and the quantum well layer is denoted as 11. Column 2 lines 56 – 67 teach the SBR degree of the saturable effect can change with distance from the top layer, and positioning within a layer of the quantum well. Fig. 2 shows an example where such a modification has been made. Column 4 lines 15 – 28 teach alternative Group III-V materials that can be used, and how the layers might be strained.

Regarding claim 2, see Fig. 2 of Knox.

Claims 14, 18 and 19 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Alcock et al US 5,901,162 (herein after known as Alcock). Fig. 1 of Alcock teaches a cap layer 2, a transparent substrate 1, quantum well structure 8 and DBR layers 7. Layer 2 is an AR coating.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 3, 4 and 5are rejected under 35 U.S.C. 103(a) as being unpatentable over Knox. ~~This claim is obvious~~ It would be obvious to one of ordinary skill in the art that the strain must be introduced in the region of the quantum well for the strain to be in the quantum well layer. In addition, material properties are well known, and choosing the best material would require routine skill in the art.

Claims 15, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alcock in view of Knox as applied to claims 1 and 14 above.

Regarding claims 15 and 17, Alcock teaches the invention as outlined in the rejection above, but fails to teach the positioning of the quantum well. However, as is also outlined above, Knox teaches Column 2 lines 56 – 67 teach the SBR degree of the saturable effect can change with distance from the top layer, and positioning within a layer of the quantum well. Therefore, it would be obvious to one of ordinary skill in the art to optimum arrangement of layers in the Alcock patent as taught in the Knox patent.

Regarding claim 16, it would be obvious to one of ordinary skill in the art to find the optimal materials of which to construct the device.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Alcock in view of Knox as applied to claims 15 – 17 above, and further in view of Cunningham et al. US 5,701,327 (herein after known as Cunningham). ~~Alcock in view of~~ Knox teach the invention as outlined in the rejection above, but fails to teach layers one half – wavelength thick. However, Cunningham teaches this in column 6 lines 5 – 9. Therefore, it would be obvious to one of ordinary skill in the art to have one half – wavelength thick layers in the Alcock in view of Knox combination as taught by Cunningham.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gioacchino Inzirillo whose telephone number is 703-305-1967. The examiner can normally be reached on M-F 8:30AM to 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Ip can be reached on 703-308-3098. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7721 for After Final communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

May 17, 2002

PAUL IP
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800